

CLAIMS

What is claimed is:

1. An imaging system comprising:
 - 2 a focal plane array (FPA) having a plurality of pixels;
 - 3 a lens adapted to focus radiation from a scene in front of the lens onto the FPA
 - 4 behind the lens;
 - 5 a shutter located in front of the lens, the shutter having a closed state that produces
 - 6 a spatially uniform reference image signal and allows internal radiant flux
 - 7 of the system to reach detectors of the FPA, and an open state that allows an
 - 8 open state image signal that includes external scene radiation and internal
 - 9 radiant flux from the system to reach detectors of the FPA; and
 - 10 a signal processing module operatively coupled to the FPA, and adapted to correct
 - 11 the open state image signal based on the spatially uniform reference image
 - 12 signal.
1. 2. The system of claim 1 further comprising:
 - 2 a shutter controller operatively coupled to the shutter, and adapted to command the
 - 3 shutter to its opened and closed states.
1. 3. The system of claim 2 further comprising:
 - 2 a system controller communicatively coupled to the shutter controller and the
 - 3 signal processing module, and adapted to control operation of the imaging
 - 4 system.
1. 4. The system of claim 3 where the system controller is communicatively
- 2 coupled to a network thereby enabling the imaging system to communicate with other
- 3 systems also communicatively coupled to the network.
1. 5. The system of claim 1 further comprising:

2 a temperature controller adapted for illuminating the scene with radiation, thereby
3 allowing reflected radiation to be received by the system.

1 6. The system of claim 5 further wherein the temperature controller includes a
2 laser for illuminating the scene.

1 7. The system of claim 1 further wherein the shutter has a lens side surface
2 that is located within five millimeters of the front of the lens.

1 8. The system of claim 1 wherein for any one session of imaging system
2 operation, each of a plurality of open state image signals are corrected based on the closed
3 state image signal.

1 9. The system of claim 1 wherein the closed state image signal is periodically
2 generated to account for changes in the imaging system.

1 10. A method for imaging a scene, where method is carried out by an imaging
2 system configured with a front lens mounted shutter, the method comprising:
3 closing the front lens mounted shutter so that external scenes are blocked from
4 being imaged;
5 generating a closed state image signal that includes internal radiant flux of the
6 system;
7 opening the front lens mounted shutter thereby allowing the imaging system to
8 receive external scene radiation;
9 generating an open state image signal based on the received scene radiation; and
10 correcting the open state image signal based on the closed state image signal.

1 11. The method of claims 10 wherein correcting the open state image signal
2 includes compensating for pixel-to-pixel non-uniformities of a detector array included in
3 the imaging system.

1 12. The method of claims 10 wherein correcting the open state image signal
2 includes compensating for offsets between the opened and closed states of the lens.

1 13. The method of claims 10 wherein correcting the open state image signal
2 includes compensating for pixel-to-pixel non-uniformities and offsets between the opened
3 and closed states of the lens.

1 14. The method of claims 10 wherein the external scene radiation includes IR
2 radiation and the imaging system includes an IR sensitive FPA for generating the closed
3 and open state image signals.

1 15. A method for manufacturing an imaging system, the method comprising:
2 providing a lens adapted to focus radiation from a scene in front of the lens onto a
3 detector array behind the lens; and
4 providing a shutter located in front of the lens, the shutter having a closed state that
5 allows a closed state image signal that includes internal radiant flux of the
6 system to be generated by the detector array, and an open state that allows
7 an open state image signal that includes external scene radiation to be
8 generated by the detector array.

1 16. The method of claim 15 further comprising:
2 providing a detector array having a plurality of pixels for detecting scene radiation;
3 and
4 operatively coupling a signal processing module to the detector array, the signal
5 processing module adapted to correct open state image signals based on
6 closed state image signals.

1 17. The method of claim 16 further comprising:
2 operatively coupling a shutter controller to the shutter, the shutter controller
3 adapted to command the shutter to its opened and closed states.

1 18. The method of claim 17 further comprising:
2 operatively coupling a system controller to the shutter controller and processing
3 module, the system controller adapted to control operation of the imaging
4 system.

1 19. The method of claim 15 further comprising:
2 providing a laser adapted to illuminate a scene with radiation, thereby allowing
3 reflected radiation to be received by the system.

1 20. The method of claim 15 further wherein the shutter has a lens side surface
2 that is located within five millimeters of the front of the lens.